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Commonwealth of Pennsylvania

SEMI-MONTHLY BULLETIN

OF

The State Livestock Sanitary Board

Harrisburg, Pa.

Vol. 1 Serial No. 2

Circular No. 26

Meat Hygiene

BY

T. E. MUNCE, Deputy State Veterinarian

April 1, 1913

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ERRATA

On page 15, under second illustration, "expensive" should read "inexpensive."

On page 39, under first illustration, second line, "tuberculosis" should read "tuberculous."

Same page, under second illustration, third line, the word "deefcts" should be "defects."

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Published by direction of The State Livestock Sanitary Board.
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April 1, 1913

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MEAT HYGIENE

BY

T. E. MUNCE, *Deputy State Veterinarian.*

Edinburgh.

The abattoir is located at Stateford on the outskirts of the city. Dr. Summerville, who in the absence of the Director was in charge, conducted the writer through the plant and explained in detail the manner in which the establishment is managed. The cost of the plant was $325,000, and it is owned and operated by the city of Edinburgh. There are four single-story brick buildings, with concrete and tile floors. The walls are lined with white tile and the ceilings are white plaster with stucco finish. The buildings are roomy, well lighted and adequately ventilated.

Approximately the following number of animals are slaughtered each week:

Cattle, ...	350	Sheep, ...	4 500
Calves, ...	150	Swine, ...	250

The city makes the following charges for the privilege of slaughtering:

Cattle, ...	42c.	Sheep, ...	10c.
Calves, ...	17c.	Swine, ...	30c.

The above charges include shelter for the animals until slaughtered. No refrigeration is furnished but stalls or cages are provided where the carcasses are stored under lock and key until called for by the butcher.

Each butcher is required to provide his own help and take care of the meat. For labor a uniform rate is maintained, as follows:

Cattle, ...	48c.	Sheep, ...	8c.
Calves, ..	12c. to 24c.	Swine, ..	24c. to 60c.

This added to the city's charge brings the total cost for each animal up to the following:

Cattle, ...	90c.	Sheep, ...	18c.
Calves, ..	29c. to 41c.	Swine, ..	53c. to 89c.

The city retains the blood and stomach contents. The offal and all other refuse is taken by the butcher who is required to sell it to a person licensed to receive and dispose of such material. The city provides, in connection with the abattoir, a plant in which offal, condemned carcasses, etc., are worked up under inspection into non-edible material.

In addition to the Director, who is a veterinarian, the city provides two veterinary inspectors, a number of sanitary inspectors and a force of other assistants and laborers.

Glasgow.

The population of Glasgow is approximately 900,000. The new Moor Street abattoir, markets and yards cover an area of about seventeen acres. There are two slaughter house buildings —one used for cattle, calves and sheep, the other for hogs and sheep. When the third building is completed it will be used for sheep. The buildings cover one full block and are brick and concrete. All floors are concrete with the exception of those in the cattle killing section, which are sand stone. The floors fall toward the front which gives perfect drainage, and they are not slippery when in use. Each building is about twenty feet to the square and the inner walls are glazed brick. The roof is slate and glass. Ventilators near the top of the walls are in the form of gratings, 2 x $3\frac{1}{4}$ feet in size. The cattle building is divided into sections or individual killing stalls, each 16 x 16 feet and is well equipped. The hoisting machines are operated by electricity. Each section is provided with hot and cold water. The partitions between the sections are concrete. The following charge is made for the privilege of killing:

Cattle,	24c.	Sheep,	4c.
Calves,	4c.	Swine,	24c.

An additional charge of 2c. is made for weighing the hide and 4c. for the carcass.

The butcher gets everything but the stomach contents. He sells the offal and blood to private concerns, which are under city supervision. Each butcher pays for killing either by the head or day, as he may elect. No refrigeration is provided by the city. Animals slaughtered outside and brought into the city are inspected free of charge. Practically all of the meat consumed in Glasgow is killed in one of the three city abattoirs. Adjacent to each killing room are covered pens with concrete walls and floors

and steel partitions which are well lighted and ventilated. All walls are washed daily with hot water. At the end of the hog killing building is the meat market where hundreds of carcasses may be seen. The salesmen wear long white coats.

Dr. Trotter called attention to the new gutting table that was recently designed by him. It is an improvement over the old kind because it prevents the blood from the plucks and liver from soiling the intestines while the fat is being removed. The table is made of galvanized iron. The track is double and the car used in transporting the carcasses is ball bearing. The car cannot leave the track and can be pushed along with slight force. Another improvement noticed was a long handle attached to the water faucet in the inspector's lavatory, which enables a person to turn the water on with his arm instead of the hand if it is soiled.

Dr. Trotter has four veterinary and sixteen lay assistants. The Veterinarians receive at the beginning $800 per year. The highest salary paid is $2,750 per year. Each man is paid according to his qualifications and the manner in which he does his work. Country slaughter houses are under control of the rural district police officials. The blood and offal are conveyed to local reduction plants which are conveniently located. Hogs for immediate slaughter only are permitted around the slaughter houses.

The building and equipment when completed will cost as much, if not more, than the one at Edinburgh. Offices with lavatories, lockers and shower baths are provided for the Chief and his assistants. There is a well equipped laboratory with a bacteriologist and chemist in charge where samples of meat and milk are examined. The administration building is a two story concrete structure.

When an animal dies in Scotland the law forbids removal of the carcass until a veterinarian makes a post mortem examination and issues a permit.

Glasgow's milk supply is examined by one veterinarian, who inspects the cows, barns and utensils. The supply comes from about 900 dairies. The samples collected are examined at the city abattoir. The inspection is not entirely satisfactory.

Dr. Trotter's Annual Report for 1910 is submitted, and it contains some valuable information.

In September 1908 the Corporation appointed a Committee of four to join with representatives of the Glasgow United Flesher's

Society to inspect and report on the slaughter houses in London, Paris, Leipsic, Offenbach-on-Main, Cologne, Breslau and Hamburg. It was thought that such information would assist the Market Committee in the proposed extension of the slaughter houses in Glasgow. The Committee also visited the abattoirs of Frankfort-on-Main, Vienna and Munich, and made a full report of its investigation. It contains information of great value to the Board and is submitted herewith.

London.

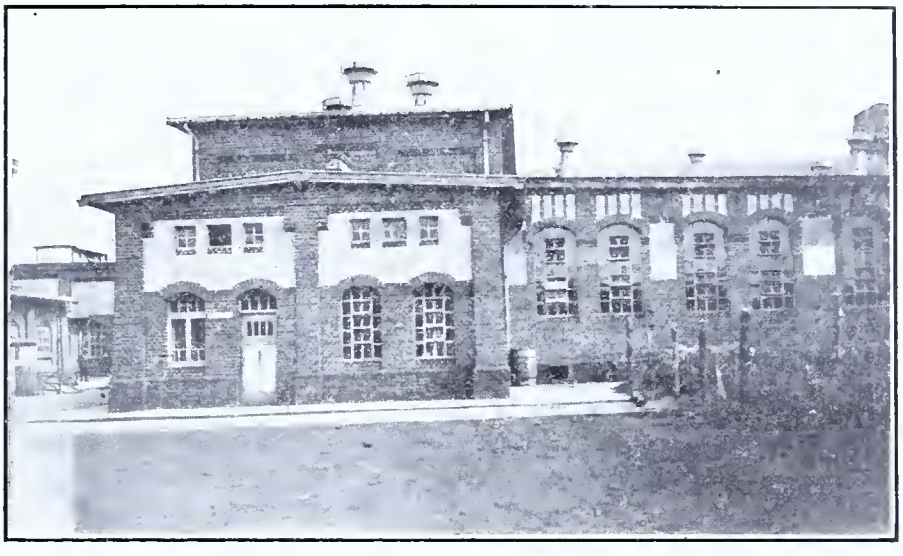
The cattle markets are divided from the slaughter houses by a public street paved with granite. The markets will hold 10,000 cattle and 30,000 sheep. In the centre of the plot is a building with offices for the superintendent, a bank, and smaller offices which are rented to traders. The old slaughter houses, adjacent to the markets, are now utilized for stables, general stores, etc. The lairages provide accommodation for 4,000 cattle and 6,000 sheep.

The new slaughter houses were opened on December 11, 1907. They were erected by the Corporation of London, at a cost of upwards of $160,000 from designs by the City Surveyor, and are so planned that they can be extended without serious structural alterations. They were the first public slaughter-houses in London. The buildings are lighted by electricity supplied by the Islington Borough Council.

The waiting pens for cattle are shut off by close-fitting doors. The blood is drained into sunken channels covered with galvanized iron grating.

The slaughter houses for bullocks and sheep are divided into ten compartments, each measuring 25 x 20 feet, and are separated from the cooling room by a roadway. The walls are lined with glazed bricks, and the paving is blue Pennant stone. Ample ventilation is provided. On all sides of the killing chambers are perforated pipes about 6 feet above the floor, controlled by a stop-cock which, when turned on, causes the walls to be flushed with water at high pressure. Six bullocks can be slaughtered at one time in each room. The carcasses are lifted by cranes worked by electricity.

The cooling rooms, 200 x 30 feet, are situated opposite the killing rooms, are well ventilated and divided by passages 12 feet wide. The cooling room will hold 720 sides of beef and 1,000 sheep.



The Municipal Abbatoir at Neuss, Germany. Note the ventilators in the windows.

Slaughter-house with unsanitary surroundings. Observe the dead horses under the snow, also the barrels and piles of bones outside of slaughter-house.

The pens for pigs are placed alongside the slaughter houses. By means of a sloped passage the pigs ascend into the sticking pens, which are provided with the necessary scalding tanks. The cooling room is 60 x 40 feet, with accommodations for 1,200 carcasses. Outside the slaughter-house is a sewer trap 10 x 8 feet in size, where the refuse is collected and cleaned out daily.

There is a room for diseased meat. It is passed through an iron chute into a Podewil destructor underground, where it is destroyed. The destructor is expensive but it does its work well. The engine and machine room are underground.

Paris.

Paris has the largest general produce market in Europe, if not in the world. It occupies four squares, and is divided in such a way that each market is occupied by venders of a certain class of produce, i e., one for meats, wholesale and retail; one for fish and other sea food; one for eggs and dairy products; and one for vegetables, fruits, flowers, etc. The prices displayed on cuts of meats were about one-fourth less than the price demanded at home. The same was true in reference to vegetables and other produce. The stalls for displaying meats and produce are not unlike those used in our own markets. Meat is not all under screen, yet a great deal of it is partially protected, which indicates that some effort is made to safe guard the consumer from contamination. The market is well lighted and ventilated and was reasonably free from flies.

The cattle markets and slaughter houses, erected in 1867, are situated in La Villette, a busy district of Paris. The buildings are of brick, and the main passages are granite. It is proposed to replace these buildings by modern ones at an estimated cost of $10,000,000.

The main entrance is from the Rue-de-Flandre. To the right of the entrance is a guard-room for the militia, and in the immediate neighborhood are the administration offices.

The cattle are inspected on arrival, and animals suspected of disease are placed in a special slaughter-house.

The cattle markets are separated from the slaughter-houses by the Canal de Lourcq, and are covered with a wooden roof, and open at the sides. The main passages are granite, and the cattle are tied to iron rails. Communication between the markets and

slaughter-houses is by a bridge, which is continually guarded by the militia. The markets are under the control of the municipality, and provide accommodation for 8,000 cattle.

The animals are conveyed to the markets in specially covered vehicles, and railway trucks.

The market is equipped with a refrigerator, which belongs to the Government, and is used only in times of war.

There are extensive stores and yards where hose, brushes, sweeping machines, etc. are kept. There is no Freibank here. Extensive railroad sidings run along the markets.

The principal market days are Mondays and Thursdays, and before each market day the whole place is disinfected.

The expense of maintaining the militia in the markets and slaughter houses is borne by the City Authorities and the Government equally.

The lairages are situated immediately outside the killing-rooms, and adjacent is a long building divided into broad sections, where cattle are kept until they are to be slaughtered.

The slaughter-houses are divided into separate rooms. The floors are concrete. Other slaughter houses are situated in an opposite district of the city.

The average weekly slaughter is as follows, viz: Cattle, from 3,000 to 4,000; pigs, 4,000; sheep, 25,000 and calves, 1,200.

Rooms are provided for the slaughter of calves and sheep, and another where heads are dressed in an expeditious manner by machinery. The heads must be delivered to the cleaner within a few hours after the calves are killed if the work is to be done satisfactorily.

Concrete tanks were fitted up for cleaning tripe.

The pig slaughter hall, situated near the main entrance, is a large round building with a concrete floor. It is lighted by windows from the side, and is divided into seven sections, each constituting a separate slaughter hall.

The carcasses are covered with straw, and the bristles burned off. This method, it is said, imparts a special flavour to pork. Women and men dress the carcasses. The hall is large, and the hanging accommodation is also extensive. The floor is concrete, and the building is lighted by side windows. The sheep killing rooms are separate. The carcasses are hung on coaches holding about 48 each.

Cologne.

Dr. Brutzler, the Director, presented me with a copy of his recent report, and a phamphlet showing the plans of the city abattoir, both are submitted.

The markets and slaughter-houses are situated about two miles from the centre of the city and cover an area of 35 acres, including the railway sidings. The buildings erected in 1892-5 are brick, with stone and granite dressings. The machinery is operated and the place lighted by electricity.

Facing the principal entrance, in the centre, are the "Bourse" and the administrative offices, which divide the markets from the slaughter houses. The "Bourse" contains a large restaurant, two banks, a post and telegraph office, and numerous private offices, which are rented at about $62.00 per year, including light and janitor service. Immediately beyond the "Bourse" are the administrative offices, and the residences of the Directors and Officials.

A railroad siding is located along the market, where the cattle are landed. They are placed in pens adjoining, where they are immediately inspected. Animals are not permitted to be driven through the streets to the market, but are conveyed by cart, wagon or rail.

Permission is granted to dealers to take cattle to their own byres, but this is not done as a rule as they can be kept cheaper in the lairages.

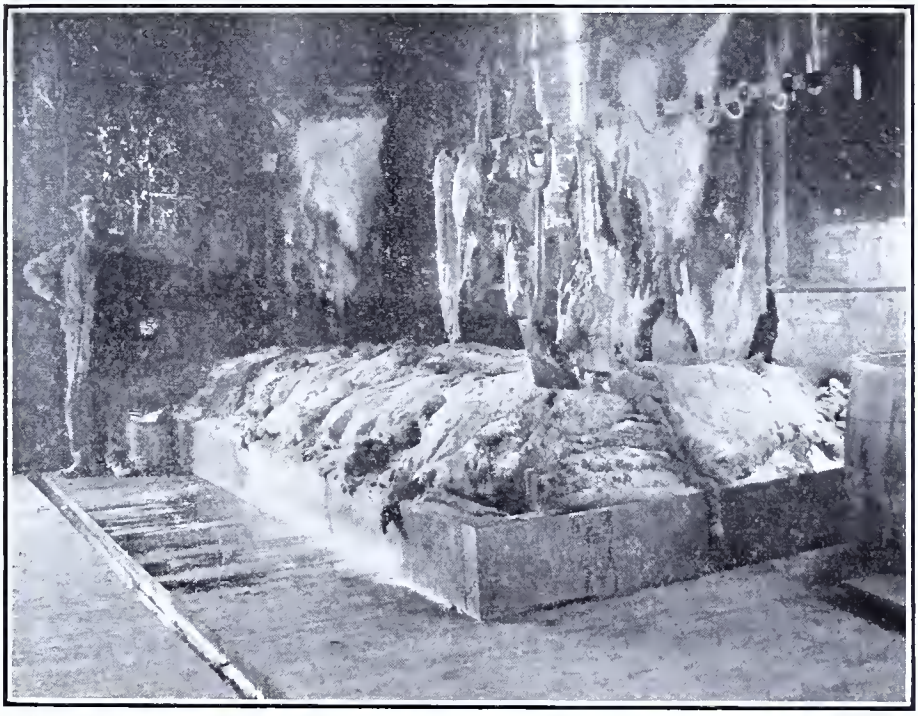
The markets and slaughter-houses are arranged in three sections, viz: 1 Markets, 2 Slaughter-houses proper, and 3 Sanitary and Horse Slaughter- houses, etc.

There are four separate blocks of buildings for cattle, and on the left are two large buildings, one for sheep and one for pigs. To the right of the main entrance are the Markets and lairage for cattle.

The cattle market is a large building situated on the right of the main entrance, and covers 3 acres of ground. The walls are brick faced with cement inside for a height of six feet, with glass above to a height of thirteen feet. The roof is wood covered over with felt, supported by light steel couples. The floor is ribbed tile. The building is well ventilated by pivoted windows manipulated by levers from the side.

There are four byres for large cattle, each divided into twenty-six compartments accommodating 1,200 animals. They are well

Killing room of building shown in preceding picture. The above demonstrates what a careless and slovenly butcher can do with a good tile building with cement floor. Observe the offal, manure and bones on slaughter room floor and outside of door. This was an ideal breeding place for flies.



A satisfactory slaughter-house in 1908 except that the hides are stored in the slaughter room. Note the liquid from the hides on the killing floor. A separate hide room has since been provided.

ventilated, lighted by side windows and are well fitted up. The floors are ribbed tile.

The hall for pigs is separated from the sheep hall by a large plot of ground. It is fitted up with roomy pens, the floors are concrete, and the fencing and gates are steel. The passages are 4′ 6″ wide, the gates connecting the pens are 4′ 6″ x 3′ 6″, and open on either side of the passage.

The sheep and calves are housed in a building similar, but smaller than the one for pigs.

The killing halls—two for cattle, one for sheep, and one for pigs, with tripery adjoining are on the left of the main entrance. The yearly slaughter of bullocks is about 33,500 and of hogs 196,291.

In the construction of the cattle slaughter-houses the hall method is adopted. Each hall has accommodation for killing 96 animals at one time. The floors are granite, and the inside walls are tiled to a height of about 8 feet. On the side of each building is a system of stalls, separated by a partition from the main floor. Each stall is about 12 x 14 feet and separated from each other by a galvanized grating. In these stalls the butcher runs off the entrails, fat, etc.

The cattle are secured to rings in the floor, and shot with a special pistol.

The hall for sheep and calves is smaller, and arranged somewhat similar to those for cattle. The sheep are stunned by a blow from a mallet before being bled, and the calves are slaughtered on tables.

The pig hall is large and ventilated by windows in a raised portion of the roof, and are opened and shut by levers at the side of the pillars. The waiting pens the whole length of the hall have doors leading into the passages where the pigs are killed. In the centre of the passages are a number of round scalding tanks, which are about three feet high and heated by steam. Pillar cranes are used for lifting the carcasses into the scalding tanks.

The method of slaughtering pigs is somewhat novel. One of the hind legs of the animal is tied to a ring in the wall. The killer then places a small mask over the head of the animal. A sharp blow is struck with a wooden mallet which renders the animal unconscious. This is expeditiously done and a great number can be disposed of in a short time. The animal is im-

mediately bled, the blood saved, a small hook is placed in the jaw, the carcass lifted into the tub for scalding and then prepared for examination. The carcasses are split, which makes their inspection easier. An overhead railway runs from the killing rooms to the chill rooms.

The swine yard will hold seven thousand hogs and has three hundred and twenty pens. They kill each week about 3,500 hogs and 1,500 calves and sheep.

There is a covered pen or yard adjacent to each killing building; those in the hog and sheep yards are divided into three hundred and twenty-five pens The partitions are galvanized iron rods or gratings. The floors are cement, and the walls are lined with concrete. The employees were cleaning the hog pens after the previous day's market, and everything was attractively clean. The platforms leading to railroad yards and sidings are tile; they were dry and clean.

One is attracted by the cleanliness of the yards and pens and the freshly whitewashed partitions and fences. The sanitary building and the slaughter-houses for horses and goats are separated by a large iron fence.

There are two medium sized byres set apart for animals suspected of disease, and another where such animals are slaughtered. Near the houses for sheep and calves are two large pens and a room for pigs suspected of disease. Goats and other strong smelling animals are slaughtered in a separate room.

A weigh-bridge is used for weighing live cattle.

The stomachs of cattle are conveyed in barrows to chutes through which the contents are deposited in wagons.

Suitable cold storage is provided. An over head trolley is used to convey the carcasses to the cooling room where they are allowed to hang twenty-four hours. If the owner has no chamber in the cold storage room he is charged twelve cents per carcass for every twenty-four hours. Cold storage is provided in three separate sections—one for pork, which has a separate chilling plant, one for beef and mutton, and the third is divided into apartments with metal railings, averaging about 40 square feet. These are rented to salemen for $18.60 per year.

A small section of the cold storage is reserved for carcasses slightly affected with measles. Such carcasses are hung in the freezing room for twenty-one days before they can be sold. In that time the germ is supposed to be destroyed.

The machine room contains a double set of engines, which work the chilling and freezing rooms, and has a capacity for producing 18 tons of ice per day.

There is a Freibank and sterilizing room where meat of an inferior quality is sold, either raw, parboiled or sterilized.

There are buildings used in connection with tallow melting and the manufacture of lymph.

A destructor is erected near the slaughter-house where condemned carcasses are prepared for fertilizer.

The principal days for killing are Mondays and Thursdays. Each butcher pays the city a certain amount for the privilege of killing, and $12.00 per year for each quadmeter space for cold storage. The stalls in the cooler vary in size, and the cost depends upon the size. The stalls are galvanized iron, cement floor, glazed brick and cement walls. The market one day was about as follows, dressed weight:

Swine—$20.40 per cwt.
Sheep—$21.60 to $24.00 per cwt.
Cattle—$19.20 to $26.40 per cwt.
Calves—$21.60 to $28.80 per cwt.

The chief veterinarian has nine qualified veterinarians assisting him.

The annual salary is as follows:

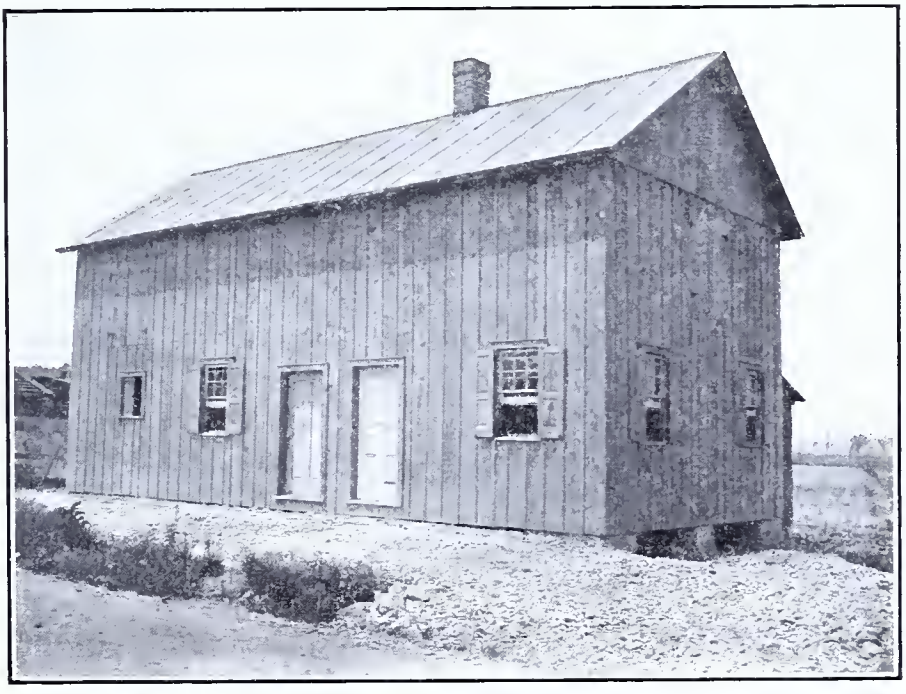
The Director,	$1,896
Assistant,	$1,080 to $1,560
Veterinary Inspector, 1st class,	$ 840 to $1,392
Veterinary Inspector, 2nd class,	$ 792 to $1,320

The Director is furnished regularly six veterinary inspectors and two additional on killing days. Three inspectors are laymen; one is employed in the yards, one in the manufacturing rooms, and the third looks after the animals that are received and unloaded. There are thirty-four assistants furnished by the city to clean and look after the plant. This is the largest municipal abattor in Germany.

The Director's report covering the period from April 1, 1911, to March 31, 1912, is submitted.

The Authorities are negotiating for two adjoining districts, and, if successful, it will be necessary to make a further extension of their slaughter-houses. In addition to $2,009,765 already spent on market and slaughter houses, it is proposed to spend $375,000

A slaughter house in 1907. The blood and waste water were permitted to escape through slaughter room floor to the ground. Hogs kept to clean up offal were allowed to wallow in the blood and filth underneath the building. Hogs can be seen eating offal in foreground. Note bones in hog yard and general unsanitary surroundings. A good breeding place for flies.



An expensive, yet roomy, well-lighted, ventilated and arranged slaughter-house.

more. There are four acres of ground unbuilt, which can be used for further extension.

Offenbach-on-Main.

The slaughter-houses belong to the municipality, are situated about a mile from the centre of the town in open fields, and were erected in 1902-4. The main approach is through an avenue of trees and at the entrance is a handsome iron gate.

The buildings are red brick, and lighted by electricity generated on the premises.

As at the other slaughter-houses visited, ample railway facilities have been provided for the transit of cattle. Driving cattle through the streets of the town is not permitted.

Care has been taken to have the light from upright side windows. This is more economical, provides better ventilation and obviates the necessity for obscuring the sunshine in summer.

To the right of the main gateway is a building, three stories high, which contains a restaurant, dwelling house and rooms for the butchers' society. Further to the right dogs, horses, light vans, carts, etc., are housed free. In all the principal towns in Germany, Austria, Holland and Belgium, dogs are used for drawing light loads.

The pig lairage is divided into 26 pens similar to those in Cologne. The passages are about four feet in width and the pens are fitted with double hinged gates of malleable iron, 3′ x 3′ 9″ The ceiling is brick arches carried on metal beams and the doors are steel and corrugated iron. The story above is used for feed.

The pens for calves and sheep are built similar to the pig pens. They have concrete floors, and are well lighted from the roof. On the right are a number of horse stables, each containing 14 stalls. There are three byres, each will hold about 32 bullocks. The floor is brick and radiators are used for heating.

These slaughter houses were the newest and smallest visited. The hall for killing cattle has a stone floor and is lighted by windows at the sides. The inside walls are lined with glazed tiles for a height of nine feet, and the usual overhead railway is provided.

The offal room, fitted with the necessary tanks, adjoins this hall. The hall for sheep and calves is a medium sized square building, high and well lighted. The doors are steel and gal-

vanized iron, and hanging rails are placed at regular intervals across the hall, with hooks attached, on which carcasses can be hung. It is ventilated by windows placed in a raised portion of the flat roof, which work on pivots and are controlled by levers. The pig killing hall is somewhat similar to the one for sheep and calves. Between the divisions an overhead railway leads to the chilling chambers.

This is a separate hall with a concrete floor where horses are slaughtered. The inside walls are faced with enamelled tile, and light is obtained by windows in the sides of the building. Adjoining, and similarly constructed, is a house where animals suspected of disease are slaughtered and inspected. There is a separate room for inspecting meat which is brought from outside districts. Wash basins and spray baths are provided for the use of the help.

The chilling rooms are very large in proportion to the size of the other buildings. They are divided from the slaughter-house by a central passage, 50 x 335 feet, which is covered and paved with concrete. Accommodation is provided for 150 carcasses. The floors are glazed tile, which is slippery and not satisfactory.

The cold storage occupies two floors. It it divided into spaces 4′ 9″ x 8′ 6″; lighted by stained glass windows and have tiled floors. They rent for $30.00 per space, and the occupants may use the chilling rooms free of cost. Others are termed "outsiders" and are required to pay six cents per hook for each 24 hours. The chambers are used for meat, eggs and other perishable commodities.

Next to these chambers is a larger room, one with walls tastefully decorated which contains the machinery for producing cold storage, electric lights and mincing meat. Ice is manufactured in large quantities and retails at about eleven cents per cwt.

The Freibank is a medium sized room well lighted and ventilated. The walls are tiled in the lower half and painted with white enamel above. The floor and counter are tiled. A double iron rail is erected along the counter so customers are admitted one at a time. The upper story is a dwelling house.

The stomachs are conveyed in barrows to another room and emptied down chutes into iron carts and sold to farmers.

Frankfort-on-Main.

The markets and slaughter-houses are about two miles from the centre of the city, belong to it and are under its supervision.

They cover an area of 29 acres and cost $2,500,000. The municipality purchased the site thirty years ago for $1.80 per square yard and has considerable space for future extension. The principal entrance is through a large iron gate.

The administration offices are roomy and well fitted up, and in the same building is an ambulance room with the necessary supplies for treating accidents and emergency cases. In another room is the museum with many interesting specimens of tuberculosis, foot and mouth disease and measles. Meat of an inferior quality is disposed of raw, parboiled or sterilized, at the Freibank which is near the entrance.

The railroad siding affords the necessary conveniences for loading and unloading cattle in the market.

A market is set apart for the sale of cattle from Denmark and other countries and they must be killed within four days of sale.

The authorities permit driving cattle through certain streets in the city. No auction sales are held in the market. All dealing is private.

The markets have accommodation for 2,500 cattle and a number of buildings for the different classes of animals. The cattle are kept in one section, the sheep and calves in another, and the pigs in a third. The buildings are brick, in good order, well lighted and ventilated. The floors are concrete and the fencing and dividing rails are steel.

The building for pigs is two stories high. The lairage is underground. Sliding quarter-round covers are used on the feeding troughs, and seem to work satisfactorily. The passages are closed by double hinged gates. 14,000 pigs are sold monthly.

The byres for cattle have fireproof ceilings supported by iron beams with hay lofts above. The cattle, calves and sheep are bedded with straw or moss. Along the byres, where animals are kept is a room with an open air shaft equipped with fans for ventilating purposes.

The slaughter houses are adjacent to the markets, and comprise the following buildings, viz: Inspection room, killing halls for cattles, sheep and pigs. These buildings are brick, and the main passages are concrete blocks, or kessiling, 10″ x 10″ x 3″. The sewage is handled by the city.

The manure is stored about 100 yards from the killing rooms and later dropped through chutes into trucks. Accommodations for cleaning stomachs are provided near the chutes.

The killing room of the slaughter-house shown in the preceding picture. The floor and walls are smooth and clean. Everything has a place and is in it. Note the screens in the window.

Cattle awaiting slaughter are tied outside of the slaughter-house. In the slaughter-house the hall system is provided. The hall is high and well lighted by windows in the sides and roof, which may be opened or shut. The floors are granite and the inside walls are faced with white enamelled tile. The hall is separated from the byres by a wide avenue but the animals are docile and little difficulty is experienced in driving across it.

The sheep and calf hall is similar to the cattle hall but smaller. It contains ample hanging accommodations. The animals are felled before bleeding as fixed by the Government.

The pig hall is similar to those in the other slaughter-houses. Accommodation is provided for 1,400 pigs per day, and there is a good supply of hot and cold water.

Microscopical examinations are made for trichinosis in pigs in a large commodious room. The floors are glazed ribbed tile, and the walls are faced with polished cement.

Every facility is given for cooling the meat which is greatly appreciated by the trade as it is more easily handled and can be delivered in better condition. The chilling rooms which lead from the killing halls have granite floors, and the usual overhead railway arrangement.

The freezing room is underground, and the chilling rooms, which are quite convenient to the killing rooms are well lighted, and capable of holding over 200 sides of meat at one time. The floors are kessiling, and the chambers are rented to the public. Each apartment averages about 40 square feet and from $30 to $35 is charged for annual rental.

There are three large engines provided for running the chill rooms and the electric lights. A room adjoining the machinery room contains lockers for the use of the employees.

Ice is made extensively and sold at about 10 cents per cwt. The rooms used for this purpose are kept very clean, and the machinery is powerful and in excellent condition.

Near the slaughter houses is a building for the sale and disposal of hides and tallow and rented to the Fleshers' Society at 7 per cent. on the cost of the building. The Society has to supply and keep fitted up all machinery according to Government regulations.

There are no other works in which fat or hides are treated in the city.

The manufacturing room of establishment shown in second preceding picture. Note the smooth, clean floor, walls and work bench. Also how clean the machinery and entire equipment is. The room is well lighted and the windows screened. Observe the hydrant and hose. This butcher knows that plenty of good water conveniently located is necessary to keep a slaughter house clean.

Hamburg.

The markets and slaughter houses are situated near the western boundary of the city. The buildings are brick, intersected by streets and connected by subways. The sections are well planned and fitted, but owing to the shape of the different plots of ground the buildings are not compact. The ground covers an area of $57\frac{3}{4}$ acres.

Cattle cannot be driven through the streets unless they arrive on the evening before market day, then only on streets specially named. Nearly all cattle are conveyed to market by rails or on floats. An extensive railroad siding is contiguous to the markets, where the animals are landed and placed in convenient lairages. Each truck used for cattle must be disinfected on arrival at a cost of 25 cents each, and is added to the cost of transportation. Other vehicles are disinfected free of charge.

To the left of the principal entrance is a large square building, two stories high, surmounted by a clock tower and containing the offices of the director, the chief veterinarian, board room, general offices and inspection rooms. To the right is a restaurant.

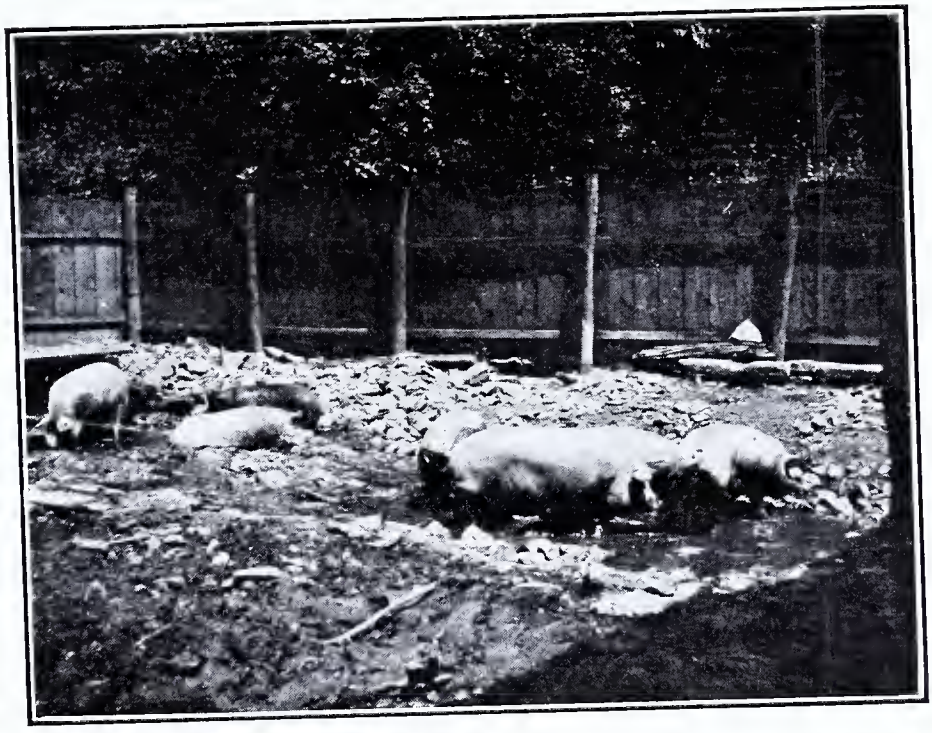
The cattle market will accommodate 5,000 cattle. The upper half of the walls is glass which affords abundant light and ventilation. The floor is brick and the fencing wood. A portion of the market is set aside for the sale of foreign cattle which are principally from Denmark.

Pens for calves and sheep are situated on the north side, adjoining the railroad. They are large and well equipped. The floors are brick and the passages convexed in the centre, which causes the liquid to flow to the gutters. The fence is wood, having on the top a movable iron rail. Iron rings for tying calves are attached to the fence. Calves arriving at night are allowed to run loose in the pen. On an average 1,800 calves are slaughtered per week.

The pig lairage will accommodate 6,000 to 7,000 pigs, and on an average of 8,000 pigs are killed per week.

The fence is sheet iron and arranged very much the same as in other markets. The outside passage leading to the brick pens is paved with stone from Saxony. The partitions are wood and not up to date. The doors are light metal and open outwards. There is a room containing a machine for weighing pigs which are sold by live weight. The pigs are run through the streets from the

This like many slaughtering rooms visited was being used for any purpose which might suit the owner's convenience.



Hogs feeding on offal in slaughter-house yard in 1907.

market to the killing rooms, but it is intended to make a connecting subway for their transit.

A large open court, paved with granite, gives access to and greatly facilitates the traffic connected with the slaughter-houses. The main passages which are granite lead to the various sections of the slaughter houses.

The byres are situated a distance of 450 yards from the market, and are fitted up with every convenience for the comfort of the animal. They are lighted by windows in the sides, the partitions are wood and the floors granite. To the door of each byre is fixed a board which contains the number of the byre, the name of the owner, and the mark with which the animals are branded. Consequently no difficulty is experienced in identifying the animals. Convenient water taps are placed along the passages.

The cattle halls are adjacent to the pens and measure 390′ x 70′, the height of the roof is 30 feet. They are similar to those in Cologne and are lighted by windows in the roof and sides. The floors are granite. Overhead lifting and travelling gear is provided, which enables the carcasses to be raised and moved about freely, either in a longitudinal or transverse direction.

The hall system adopted here is objectionable. A number of traders stated that it permitted pilfering, and owing to the heavy general traffic is difficult to keep clean.

Shooting with a special pistol is done to a limited extent by men appointed for this purpose. Most carcasses are quartered before taking them to the chill rooms located some distance from the killing halls.

A special permit from the superintendent is required before cattle can be killed except during market hours.

There is a special small slaughter-house where animals suspected of disease are promptly slaughtered. If disease is found, the carcass is dealt with in a manner similar to that followed in Cologne.

The tripery, which is fitted up with all modern appliances has a granite floor, brick walls, and is lighted by windows in the roof. The tripe is used principally for feeding dogs.

The floor of the pig killing hall is of freestone. Small pens, butchers' tables, scalding and cleaning tanks are inside the hall, and overhead a travelling gear has been erected. The following method is adopted in killing pigs. One killer catches the pig with an iron hook and his assistant catches it by the tail. The two

place it on a low bench where it is held while another killer stuns it with a club shod with iron. It is then bled and the blood is saved.

In a room adjoining the hall lockers are provided for tools, clothes, etc.

Galvanized iron bars are used by inspectors for the conveyance of diseased meat. Ample cooling facilities are provided.

The cold storage accommodation provided is the most extensive on the continent. The floor space measures 100,000 square feet. The chambers, which occupy three floors, are rented to a private company, and meat, fish and other provisions are stored in them. The same privileges are extended to fleshers, and outside parties.

The plant and machinery are used for cold storage, for producing electric light, and making ice. 1,250 cwts. of ice is manufactured per day, and sold at 12 cents per cwt. The market owns and operates two other ice plants in the city.

A special arrangement has been made for disposing of the manure. The killers place the stomachs on barrows and wheel them to another building where the contents are emptied down chutes into special wagons at the bottom. Valves are attached to the wagon so that the liquid in the manure is run off into a cesspool beneath and thence to the sewage works. There are specially built iron carts which are filled with manure and sold to farmers who take it to their farms and return the carts empty. The manure is sold at 48 cents per cart load. It must be removed at the purchaser's expense. No difficulty is experienced in disposing of it. A revenue of $4,000 per annum is derived from this source.

The tallow melting is carried on in a special building erected inside the market, which is rented to butchers.

A considerable quantity of ground belonging to the city joins the markets, and can be utilized for further extensions if necessary.

Berlin.

The large markets and slaughter houses are situated some distance from the centre of the city. They were built on the old portion of the city in 1830 and the modern section in 1880, at a cost of about $3,750,000. The site is irregular in shape and measures about 3,300 by 1,500 feet.

The "Bourse" situated in the centre of the site, facing the entrance gate, covers an area of 5,000 square yards and contains

an assembly room, banks, administration offices, restaurant, etc.

The cattle are not allowed to be driven through the streets, but are brought into the market by rail, cart, or wagon. A railroad runs along the north front of the cattle market and a special siding is provided where the trucks are disinfected. The work of disinfection is carried out by the market authorities. A charge of 48 cents for a single wagon, and 72 cents for a double wagon is made.

All cattle are inspected by the Government Veterinarian. Animals suspected of being diseased are put back into the wagon, in which they arrive, and taken by a special railway siding into the sanitary slaughter-house where they are dealt with immediately.

The outside passages are about six miles in length. Brick is freely used for the building material. The lights on the roofs are upright and sheet iron and concrete are used for divisions in the pig pens.

The markets are capable of accommodating 5,000 cattle, 17,000 pigs, 35,000 sheep and from 5,000 to 7,000 calves.

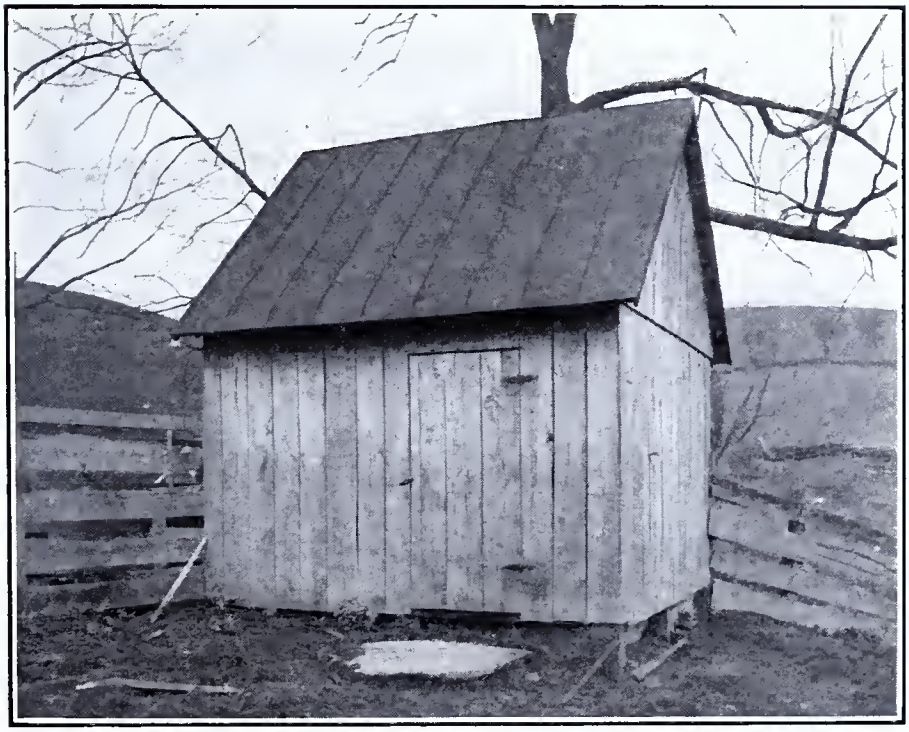
The cattle market covers about four acres. The walls, for half their height, are brick, the remainder is glass. The doors are steel and galvanized iron. The roof is wood supported by light iron couples. Wood fencing, with iron posts, separate the pens. The passages and floors are brick, which affords a good footing. The cattle are in the market for one day only so no litter or bedding is provided in the pens.

Near the market are 12 blocks of brick byres, each affording accommodation for 30 cattle. They have brick arch ceiling, with fodder lofts above. The feeding trough and passages are concrete.

The market for calves is a large square two story building, divided into 181 pens, and will accommodate 2,000 animals. In the more modern portion of the building the partitions are sheet iron, 18 inches high, surmounted by iron railing of a similar height. The doors of the pens are malleable iron and sheet iron with single hinges, closing by a simple hook arrangement, and inside the pens are doors giving easy access to the neighboring pens. The floors are brick, and the roof is wood covered with asphalt. Seats suspended by chains are placed in the passages.

The arrangements for feeding calves are very complete and capable of dealing with 2,000 calves. The food is principally boiled milk and bean meal prepared in a special kitchen in the

A rural slaughter-house located by an agent in May 1908. The blood and what little water used was allowed to collect on foreground causing mud hole.



After the use of the structure shown in the preceding picture was ordered discontinued by the Board the above slaughter-house was erected at a nominal cost.

third story reached by a spiral stairway. It is transmitted through pipes to tanks in the feeding pens and each tank has a capacity of five gallons. The charge for feeding is six cents a day for a calf, but practically no profit is derived from this source.

There are four sheep pens, measuring 240 x 60 feet. The pens are wood, and the ceiling is brick arches carried on iron girders and columns. The lofts above are used for storage.

The sheep market contains 307 pens, and is similar to the one for cattle, and will accommodate about 15,000 sheep

There are two market halls for pigs, one for the home trade 720 x 222 feet, which is divided into 600 pens of various sizes, accommodating 10,000 pigs and the other for Hungarian pigs is 222 x 198 feet. The pens are wood between iron posts and are paved with brick, the main passages are concrete. The authorities are considering the advisability of making new pens of sheet iron half way up and iron rails on the top. A large number of pens have been erected outside the halls under an overhanging roof.

Outside of the pig market there is a railway siding and a platform adjoining paved with brick where the pigs are landed.

In the slaughter houses for cattle are three long rows of separate killing rooms, which are used only by wholesale butchers, no killing is done by retailers. Contiguous to each row is a wide passage in which chambers are constructed of iron fencing as a storage room for meat. The floors of the killing rooms are tiled The roof is very high, and ample ventilation is provided. The fittings are not modern and no overhead gear is provided. Rings are attached to the outside of the killing rooms where animals awaiting slaughter are tied. The byres adjoin the killing rooms, and are constructed in sections to suit the dealers.

The pig killing rooms are commodious. The number of pigs killed annually is about 1,200,000. The floors are ribbed tiles, the walls, to a height of 10 feet enamelled brick in cement, and the doors are iron. These rooms are lighted from side windows. There is a high water tower to which water is pumped from the river and used for cleaning the pens and killing rooms.

A new pig hall has been built. The walls are brick, enamelled half way up, and the floor is paved with tiles. The rails on which to hang carcasses are placed at regular intervals, and have double hooks attached. At one side of the hall are numerous small

rooms, which are let to persons killing pigs regularly. The killing halls are similar, but smaller than the one for pigs.

The tripery is an extensive building lighted from the roof and sides. The floor is ribbed tile. Granite tanks, with a copious supply of hot and cold water, are provided for washing tripe. The tallow melting building belongs to the market, and is rented to the butchers, who own the machinery and carry on the work. There are two rooms where condemned meat is collected and transferred by wagons to the destructor.

Breslau.

The markets and slaughter houses are situated about two miles from the centre of the city in the northwest section. They were opened in 1896 and cover about 98 acres.

Driving cattle through the streets is prohibited. Cattle coming from the markets other than by rail are conveyed in vehicles, sixty miles in some cases. The animals are usually brought into the city during the night, and inspected at the markets on the following morning.

At the entrance gate there is a building containing a post office and bank for the use of those doing business in the markets. To the right is a large square building, surmounted with a clock tower. In this building are commodious administrative offices and a large office where the market dues are paid. There is a dwelling house close to this building which is occupied by the engineers in the markets, and an additional building is being erected for the accommodation of employees. The buildings are red brick and the main outside passages, which are very wide, are laid with granite setts. The main passage way leading to the principal sections of the markets is of considerable length, covered with a wooden roof supported by light iron girders, and lighted by glass windows.

There are numerous plots of ground in different portions of the markets. Some are let to the Park Department of the city, others are laid out as gardens, or used by the employees for the purpose of growing fruit, vegetables, etc.

A railway siding runs the whole length of the cattle market. Reception pens made of steel tubing have been erected thereon. The pens and passages are laid with granite setts. The locomotives used for shunting purposes belong to the slaughter house authorities.

Suitable recreation rooms, baths, etc., for the use of the employees in the market are being erected. The baths are to be of the spray pattern with floors and walls of terrazo.

These slaughter houses are built after the plan of those in Offenbach, but on a larger scale, and the lighting is on the same principle.

The markets occupy 10,500 square yards of ground, and are of a light iron construction covered with felt.

The cattle floors are concrete and the fencing rails to which the cattle are tied are wrought iron. Troughs are provided for the feeding and watering. The doors are steel and corrugated iron, lightly constructed, and easy to work. This market holds 1,450 cattle.

There are separate buildings for cattle left unsold one market day and detained till the next day. These cattle are not allowed to leave the market. The obligation of putting them up falls on the market authorities who feed them and make a charge therefor. The byres are commodious and comfortable. The floors, feeding and watering troughs are cement. A passage runs along the head of the stalls from which the employees supply food and water to the cattle. This method was easy and expeditious.

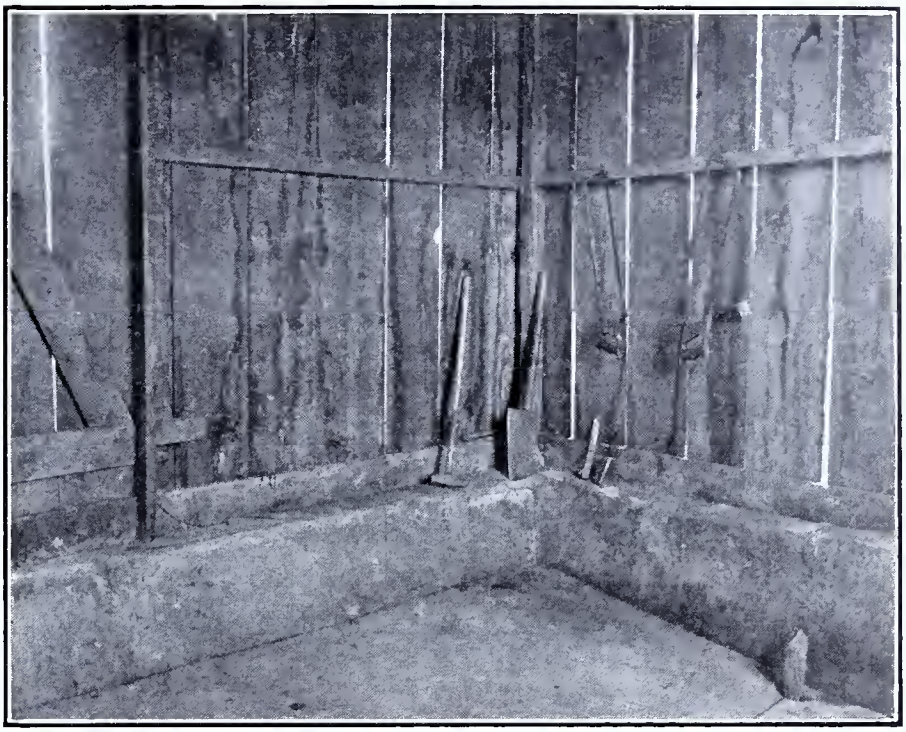
The sheep and calves are sold in a separate building, fitted up with the usual pens. One of the pens was laid with ribbed cement, and after a year's trial was found to be most satisfactory.

The accommodations for the sale of pigs are adequate. The partitions of the pens are 3 feet, 6 inches in height, concrete half way up, and surmounted by a small iron railing. A single hinged gate with a spring bolt sliding up and down, the top part shutting into a slot, was seen here and seemed to work very well. The floors are concrete. Light rails are laid along the floor on which small wagons are run for carrying manure.

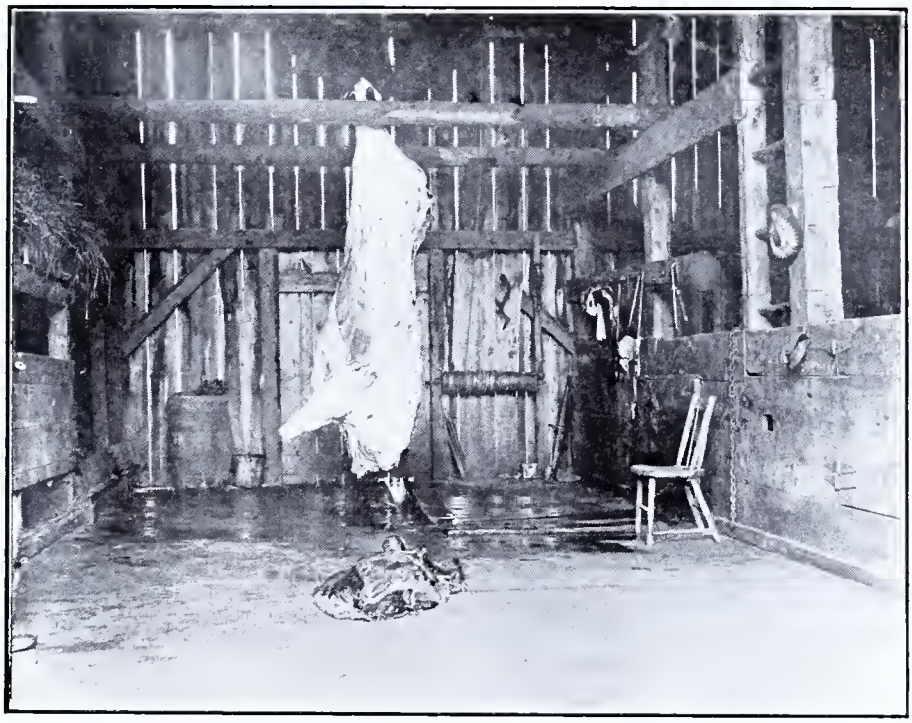
The hall system for the slaughter-houses is adopted here. On the right side of one of the principal avenues are the slaughtering halls, and on the left are rooms for boning and preparing sausage. The floor of the main hall are granite slabs jointed with cement. The building is lighted by large windows in the roof and sides.

In the cattle hall the floors are granite and the flat roof is concrete. It is lighted from windows at the sides. The winches for hoisting and lowering meat are worked by electricity, and the dynamos are erected in a room above.

Any butcher can kill in the slaughter-house by paying the regular dues.



Internal view of building shown in preceding picture. Note the cement floor and side walls, also drainage facilities.



When the State Meat Hygiene Service was organized it was not unusual to find horse stables, such as shown above, being used for slaughtering animals and storing meats.

Near to the new hall is a room 17′ 9″ by 8′ 6″ for the reception of condemned meat.

The floor of the hall where calves and sheep are killed is concrete, the roof wood, laid on light iron couples, and it is ventilated by pivoted windows. This hall is to be made into a tripe-cleaning place, and the lower portion set apart for the Jews until a special place is built for them.

The stools on which calves and sheep are placed for slaughter are iron frames, with a V-shaped wood top. On one end of the frame two wheels are placed for its easy movement, and in the centre a chain is attached for putting round the body of the animal.

Spray baths are fitted up for killers.

The pig killing hall is fitted with overhead gear on rails between each division, for lifting, carrying, and lowering the carcasses. The roof is wood, which is to be replaced by concrete. They have found that the steam from the scalding tank rots the wood. A number of small pillar cranes are used for lifting the carcass into the scalding tank. Carcasses are dressed on tables. The sticking pens are surrounded by low iron railings. The pens are divided by concrete with double hinged gates attached. The floor is granite flag.

Before bleeding the pigs are stunned with a thimbled bolt at the end of a long shaft, which is held in place by a killer while another strikes it with a heavy mallet.

A piggery has been erected near to the killing hall. The pens are divided by cement iron frames. The corrugated iron gates are fitted with double hinges. The main walls are brick cemented to a height of five feet. Overhead is a loft for fodder.

The tripery is a modern sized building lighted from the sides, granite floor and well supplied with hot and cold water.

The pig hair is dried and sold and the revenue goes towards reducing the rent.

The floor of the offal room is granite. Tanks are provided for cleaning and washing offal.

Extensive chilling rooms are located near the killing rooms. The floors are cement, and the rooms are lighted by windows from the sides and roof. An overhead railway runs from the slaughter-houses to these rooms.

About $28.60 per annum is charged the butcher for a space of 42 square feet in the cold storage plant.

In line with the new bullock byres are three stables, each containing twenty-four stalls. The troughs are fitted in concrete, the hecks are iron and the stalls are separated from each other by a single pole.

A slaughter-house for horses is being erected. From 3,000 to 4,000 horses are slaughtered each year. Cold storage chambers and rooms for the police are being erected in the basement.

A covered manure shed stands on high ground, a safe distance from the killing rooms. The stomachs are emptied on an iron plate and down chutes into railway wagons. The butchers were dissatisfied with the arrangement at first, but now no difficulty is experienced. A Hardmann diseased meat destructor is located in a separate building. The residue from it is sold for fertilizer. A large building was erected for the sale of hides and tallow and is rented by the butchers' society. In the construction of the markets and slaughter-houses the sum of $1,989,250 was spent, and $338,000 more is being spent for additional buildings. The authorities own a great deal of ground adjoining their markets for future development.

Buda-Pesth.

The markets and slaughter-houses are owned by the city and located about four miles south from the centre of the city. A commodious square building used as a municipal bank is located between the markets and the slaughter-houses. This bank was founded by the city authorities some years ago, and is carried on by them with considerable advantage to the promoters. It has a turnover of $8,333,330 per annum.

The bank receives consignments of cattle, sells them and remits the proceeds, less 5¼ per cent. commission. Money is advanced to butchers at 1½ per cent. more than the current bank rate. All the money business of the market is carried on here. The building contains a number of private offices which are rented to cattle salesmen.

The cattle market covers an area of 38,000 square yards, and can accommodate 6,000 cattle, 4,000 sheep, 5,000 calves and 7,000 pigs. In the winter accommodation for 12,000 pigs is provided. The market is open on all sides, and the roof is wood supported by wooden pillars. There are windows in the roof, but the light is somewhat deficient. The divisions are fairly large, the fence is steel, and the floor is granite.

Ample railway facilities are provided.

Cattle not sold are allowed to remain in the market until the following market day, or, if the owner desires it, they may be taken to a yard outside. A tax of $3.11 is charged by the Government for every bullock slaughtered. The byres are long and the asphalt floors are sloped from the troughs to the centre. The bullocks are tied to rings. A byre underground affords accommodation for 1,400 cattle, but the ventilation is deficient. 140,000 calves, 80,000 sheep, 100,000 cattle and 300,000 pigs are slaughtered yearly.

The slaughter-houses for cattle cover 29½ acres. To the right of the entrance are a large number of killing halls, and adjoining these are a number of smaller ones. The floors are concrete and the walls are brick. There are separate killing rooms.

Both the pistol and the pole axe are used for slaughtering cattle.

The pig halls are situated about a mile from the slaughter-house for cattle, and the ground intervening belongs to the municipality. This building was erected about nine years ago at a cost of $833,330. The entrance is by a large gateway having sliding gates and the floors are tile.

The railroad runs by the piggery, and the pigs are landed on a platform. As the pigs are brought into the slaughter-house they are marked with a stamp which shows on the hair and on the skin.

The scalding tanks are commodious, and provided with tackle for handling heavy carcasses. The carcasses are split in sides and inspected. There are several scales on which a number of carcasses may be weighed at one time. Each machine weighs up to about 1,000 pounds. The carcasses are hoisted by cranes and carried by rails into the chilling rooms, where they are allowed to set before they are put in the freezing chambers.

A building for lard near the chilling chambers is in much demand.

The rooms for offal adjoin the killing rooms, and are well equipped.

Near the piggery is a slaughter-house for horses, which is two stories. Sausage is made and cooked on the ground floor of the premises and stamped by the Government. Sausages are sold at special shops which belong to the city and under the supervision of a veterinarian. The upper story is used for slaughtering horses and boning and mincing the flesh used for sausage.

Corner of killing room. The butcher is trimming coarse meat on a filthy block. Note broken floor, tub of bones and refuse in foreground, also wearing apparel of butcher.

About 5,000 horses are slaughtered per annum. The average price of horse meat is eight cents and horse sausage ten cents per pound.

There are extensive cooling, chilling and freezing accommodations.

There is a Freibank with sterilizers which are used for carcasses affected with tuberculosis and measles. Condemned meat is made into manure, the better portions are used for feeding poultry.

Powerful machinery is used for lighting, chilling, and making ice. Six tons are made per day, and sold at 7 cents per cwt.

The museum is a large square building close to the killing rooms. It is approached through a wide passage lined with trees. Many interesting specimens of different diseases, curiosities, freaks and malformation may be seen. Specimens of the various instruments used at different periods for slaughtering and dressing animals are kept in glass cases.

A fire station for the use of the slaughter-houses, and a large water tower are provided. The water is pumped from the river and used for washing the slaughter-houses. The drinking water is supplied by the city.

Vienna.

There are five slaughter-houses—three belonging to the city and two to a private company. One is used for horses; the other two for cattle, sheep and calves; and those of the private company are used for pigs. The reason for so many slaughter-houses is that an extension of boundaries was effected, and some of the slaughter-houses were within the area annexed. The markets and slaughter-houses visited were "St. Mark's," which are the most important. They are situated in the south-eastern part of the city. The slaughter-houses were built in 1851, and the markets in 1878-1883. The buildings are brick, and are lighted by gas.

A railroad siding and a long platform are provided. All cattle are conveyed to market by rail or floats, and are inspected by a veterinarian on arrival. Cattle for slaughter only are allowed to enter the market.

The cattle market is open on all sides and capable of holding 7,000 head. The roof is constructed of light iron girders and wood, covered with tarred felt, and is supported by iron columns.

The floor is cement. The market is well lighted by windows in the roof.

The main passages, paved with granite, are 27 feet in width, and many of them are lined with trees, which gives the place a picturesque appearance. One passage was laid with cement, but it was unsatisfactory for the reason that it broke in a number of places.

The division rails are metal, to which the cattle are tied. Channels behind them conduct the liquid into gratings.

Milch cows are sold at a place outside designated by the authorities.

The floors of the main byres are brick and some of the side byres are corrugated iron. Cement watering troughs are erected in the centre of the passages between the byres at intervals of 30 yards. Each byre holds 30 animals and altogether 5,000 head can be accommodated. There are a number of byres, and large forage and grain stores underground. The byres are regularly and thoroughly disinfected and lime-washed.

The pig lairage was built to accommodate 16,000 pigs, but it will hold 19,000 at one time. The walls are brick, the floor and passages are cement and the pen divisions are concrete. Drinking and feeding troughs are provided.

The sheep hall is brick to a height of 12 feet, with glass above for another 12 feet. It is divided into pens with wood fixed in iron pillars. The roof is of wood on light iron girders.

The slaughter-houses for cattle are composed of separate killing rooms and halls, and divided from the market by a brick wall. The walls are tile and the floors granite. Tile is unsatisfactory because it chips easily and is too expensive. Three bullocks can be killed in each room at one time. The carcasses are dressed and cut up on the floors because there are no windlasses for hoisting them.

One hall has slaughtering accommodation for 32, and another 44 head of cattle at one time. The floors are cement.

The roof is wood on light iron girders. The windows are in the roof. The main passages are granite. Carcasses are hung on hooks fixed on wood bearers.

One of the officials explained that the hall system is preferable, but the private killing room permits less dishonesty.

The method of killing is similar to that in Buda-pesth.

The average number of cattle killed per week is 2,500.

No special place is set apart for the slaughter of pigs. Butchers are allowed to kill pigs on their own premises by obtaining a license. They are required to notify the inspector who must be present during the time of killing.

Chilling accommodation is let in spaces to owners of meat. The name of the owner is marked above the space. The glazed tile floors are somewhat slippery.

The market contains a commodious restaurant and a fire station. Telephones are installed throughout the market.

A special building is set apart for the sale of the carcasses of small animals.

The Government places a duty on cattle, sheep and pigs entering the market.

Munich.

The markets and slaughter houses in Munich are situated a considerable distance from the centre of the city.

The Superintendent's house and the class room of the Chief Veterinary Inspector are located at the entrance to the market.

The number of cattle and pigs slaughtered annually is roughly estimated at 70,000 and 300,000 respectively.

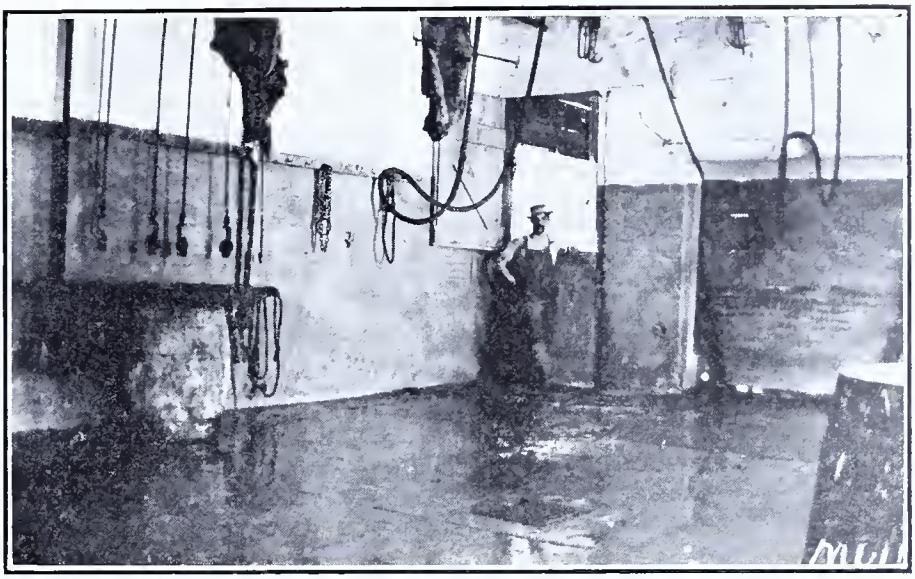
The markets, like those at Hamburg, are intersected by streets. The buildings are brick with wood roofs and the passages are granite. They are lighted from the roof and sides.

The "Guild of Fleshers" have full control of the trade. Before a person is permitted to practice as a "flesher" he must undergo a training for three years, and afterwards pass a theoretical as well as a practical examination in the handling and killing of animals. He must be versed in the diseases of animals, and able to judge the weight of animals and dressed carcasses. The Chief Veterinary Inspector teaches them the scientific method of diagnosing disease. The expense was formerly paid by the Guild, but now the municipal authorities pay one half.

The cattle building will accommodate 2,000 head, and a large space of ground is reserved outside for their inspection on arrival. Landing pens of steel tubing are erected at the siding.

A concrete tunnel 350 yards long, 12 feet wide and 10 feet high connects the cattle markets with the slaughter houses.

The hall system is adopted in the slaughter houses and accommodations are provided for slaughtering 200 animals at one time. A wide passage divides the halls from each other. The pistol and poleaxe are both used. Convenient cranes for hoisting the



This shows the same establishment after being cleaned and whitewashed. Ten per cent. of the cattle inspected at this establishment proved to be tuberculosis.

The largest hole in the earth floor was used to catch the blood which was dipped up with the bucket and can. Hides, tallow, bones and rubbish in general were stored in this room. Here the deefcts are too numerous to mention. It was necessary to cover the carcass to protect it from the flies. The place was ordered closed.

carcasses are provided. On an average 1,400 cattle are slaughtered per week.

The halls for calves and sheep have tile floors and asphalt passages. Lame calves or sheep are wheeled in a box-shaped barrow to the killing halls.

The pig hall is large, well lighted by side windows, and is situated near the cattle market. There are railed pens outside the building with double hinged gates and low double gates along the passages. The hall contains copper scalding tanks and marble dressing tables. The floor and roof are concrete and the sides are tile. Underground lairages of different sizes laid with kessiling has been used satisfactorily for two years.

The large tripery provided with hot and cold water contains cement tanks and iron barrows.

A horse slaughter house is provided.

The laboratory contains an interesting collection of curios connected with the market.

There are special rooms for the inspection of meat sent in from country districts, and for the examination of suspected animals.

The machinery for mincing meat and making sausages is underground.

A sanitary and economical manner for handling manure had received special attention. Elaborate machinery for this purpose had been erected underground at a cost of about $30,000. Great difficulty was encountered in keeping the machinery in good working order. This was due in part to the detrimental influence the liquid manure had on the steel parts of the machinery. Ultimately the benefits were found to be out of all proportion to the cost and it was decided to discontinue the process. The method now employed is a conveyor which carries the manure to wagons in a yard outside.

There is a Freibank and a restaurant in the centre of the site for the use of the employees and others frequenting the markets.

Hides and tallow are dealt with in a manner similar to that in operation at Breslau.

Neuss.

The population of Neuss is about 50,000. The abattoir located on the outskirts of the city is owned and operated by the city. The buildings are brick with tile roof. Two of them are equipped for killing. The larger building is provided with two killing rooms; one 40 x 80 feet is used for cattle and sheep, the other

40 x 60 feet is used for swine. The floor of the cattle room is stone; that of the hog room is tile. The walls 5½ feet are glazed tile. Above this point cement is used and whitewashed. The ceiling is 18 feet from the floor.

The chill and cooler are adjacent to the killing rooms. The temperature in the chill room is kept at from 3° to 6° C., while the cooler is from zero to 3° C. The city owns and operates the refrigeration plant.

The manufacturing room and the laboratory are in the same building. In the latter was numerous specimens which had been collected in the abattoir. The livestock pens are directly across the open driveway and running parallel with the main building. There is a railroad siding. The room for receiving the offal and refuse is located here. The latter is conveyed to carts below by means of a chute. The contents of the stomach and intestines are hauled away by farmers and gardeners for fertilizing purposes.

The horse-killing building is located across the rear end of the court and is used for slaughtering animals afflicted with infectious diseases. This building has a stone floor and smooth walls. The hide and tallow storage building is a one story brick structure 25 x 50 feet and stands at the end of the horse-killing room.

The number of animals slaughtered is about as follows:

Per Week.		*Per Year.*	
Cattle, ...	75 to 100	Calves, ...	1,800
Swine, ...	250	Sheep, ...	300
		Goats, ...	200
		Horses, ...	150

The Director, Dr. D'heil, is a veterinarian and has his office in the Administration Building which is located at the entrance to the grounds. He gave the writer an opportunity of witnessing the German method of slaughter house inspection.

Utrecht.

August 13th the writer called at the city abattoir and was cordially received by the Assistant Director, Dr. J. vander Slooten, who accompanied him through the establishment.

The city has a population of 120,000.

The abattoir built in 1900 and 1901 is located in the northern part of the city. There are fourteen brick buildings. The plant and equipment ready for use cost $280,000. To the left of the

main entrance is located the Administration Building. The laboratory is on the second floor of this building and is roomy with plenty of light, good ventilation and well equipped.

The Director, a veterinarian, is furnished a residence at the right of the entrance. To the right of his residence is situated the building used for receiving and storing imported meat until it is inspected. The hall for slaughtering cattle and calves is a single story structure with plenty of windows on all sides.

A short distance from the Cattle Hall and running at right angles to it is the cattle and calf stable. It is roomy and well lighted and ventilated. A wardrobe, lavatories, baths and a large smoking or assembly room is fitted up for the employees at the end of this building.

The pig slaughter hall is a single story building with plenty of windows for light and ventilation. The method for killing hogs at this plant is quite different from that used in America. The hog is shot by an employee of the city. The butcher's employees bleed, scrape and dress each animal. The establishment is well equipped and kept scrupulously clean. Here as elsewhere in Europe hog scraping machines were not used. The city would not be justified in spending a large sum of money for expensive equipment when cheap labor is available to do the work.

Under the same roof and adjacent to the pig killing hall is the pig byre which is roomy, well lighted and conveniently arranged.

The cold storage plant is located between the pig and cattle killing halls. Each butcher is required to rent space in the refrigerator. He is charged $8.00 for a little more than a yard.

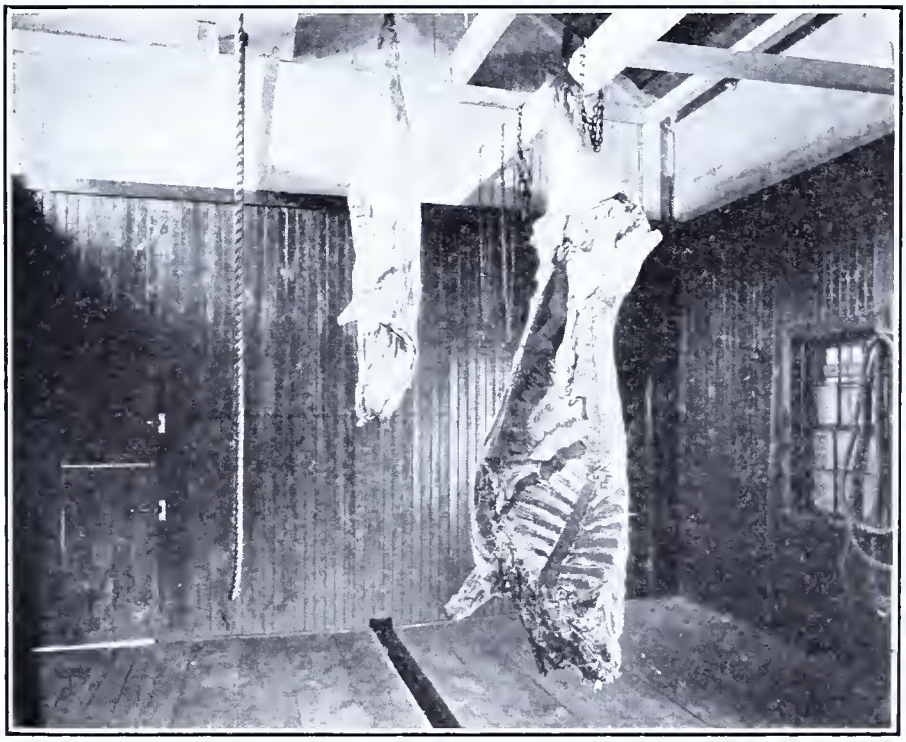
There are six other buildings used as follows:—for preparing casings and tripe; hall for slaughtering houses, which is separated by a tight permanent partition from the hall for killing diseased animals; stable for diseased animals; stable for horses to be slaughtered. One building is utilized for horses, dogs and vehicles used around the abattoir. A house is provided for the engineer and surveyor.

Each butcher may collect the blood from his own animals. What is left the city saves and sells to a nearby blood merchant.

The following tariff is charged for inspection and the privilege of slaughtering:

Cattle and horses,	$1.10
Calves,	.76
Sheep and goats,	.24
Swine,	.66

The first window and door opens into the meat market. The next door and two windows open into the manufacturing room. The farther door and window open into the killing room. The latter is shown in following picture. This plant fully equipped cost $500.



This shows the slaughtering room of establishment shown in preceding picture. Note the smooth, clean floor and walls. The latter are painted and whitewashed. Observe the quarter round at union of walls and floor which makes the room more easily cleaned. Here the butcher is not obliged to cover the meat to protect it from flies. The owner of this establishment is naturally tidy and it is no effort for him to keep the place clean.

An additional charge is made for weighing, as follows:

Cattle, alive, ...	$.12	Dead, ...	$.08
Calves, alive, ...	.08	Dead, ...	.06
Sheep and goats, alive, .	.06	Dead, ...	.04
Swine, ...	.10	Dead, ...	.06

The Director and Assistant Director are both veterinarians and receive annually $1,400 and $800 respectively. There are two veterinary inspectors who each receive $760 annually; five inspectors who are not veterinarians and receive from $280 to $440 a year; and twenty-three other assistants and employees, as follows: 1 engineer, 1 assistant engineer, 1 surveyor, 2 gate keepers and 18 laborers.

Plans have been made to enlarge the plant and add additional equipment which will cost $60,000.

Beef was selling in Utrecht for fifty cents per pound, and hogs for thirty cents per pound live weight.

DeBilt.

This is a very small place located three miles from Utrecht and contains about 800 people. The butcher shop on the main street is arranged and equipped similar to those seen in Pennsylvania. In the rear of the lot is located the slaughter house with a manufacturing room in the same building. It was erected in 1910 and is constructed of brick with a tile roof. The killing room is 14 x 15 feet. The floor and walls are cement and granite chips of a high quality.

An average of four cattle with a few sheep and swine are killed each week. The hides are sold green. The offal is removed each day to a nearby reduction plant. The blood and waste water are carried away by a sewer. The stomach and intestinal contents are placed in a cart and removed by a gardener.

Inquiry was made in reference to keeping hogs at slaughter houses to clean up the blood and offal. The filthy and dangerous practice has long been discontinued in continental Europe, and police regulations forbid it except for immediate slaughter.

Much might be said concerning the need of municipal slaughter houses in the United States as well as to the increasing necessity for the people of our Pennsylvania cities and towns to give closer attention to the question of protecting their meat supply from contamination. A few cities and towns have meat inspection ordinances which are fairly satisfactory. Many places,

however, have made no provision for supervising their meat supply. Conditions in so far as the municipal abattoir proposition is concerned are even worse. Some effort has been made in Philadelphia and Pittsburgh toward working up public interest in relation to the public abattoir. Up to this time, however, not a single place has taken steps to provide and operate its own plant.

A number of the western and southern states appear to depend more on each municipality to look after the condition of its own meat supply than for the State to supervise it. At least with a few exceptions practically all of the municipally owned and controlled abattoirs are located in the west and south. The following places have either provided or have taken steps to provide such facilities:

Paris,	Texas.	Charleston,	South Carolina.
Beaumont,	Texas.	Winston-Salem,	South Carolina.
Birmingham,	Alabama.	Grand Rapids,	Michigan.
Bridgeport,	Connecticut.	Pontiac,	Michigan.
Little Rock,	Arkansas.	Saginaw,	Michigan.
Columbia,	South Carolina.	Nashville,	Tennessee.
	Savannah,	Georgia.	

The citizens of Toronto, Canada, have voted to provide a $300,000 plant at which all slaughtering will be done by the city. When completed this will be one of the finest and most modern equipped plants in the world and will be a credit to Canada. Winnipeg, another Canadian city, has arranged for its own abattoir and inspection.

In the Island of New Zealand every town of two thousand or over is required to provide a central public abattoir at which all the slaughtering is done under inspection.

An up-to-date public abattoir has been provided by the officials of Shanghai, China. The floors and walls are concrete, and we are reliably informed that the establishment is kept scrupulously clean at all times. The cost of slaughtering is: ox, 85 cents; calf, 25 cents; sheep, 10 cents, and pig, 20 cents.

Perhaps the most striking characteristic of the European abattoirs is that they are invariably built on the single story plan. Instead of economizing in ground as is done in this country by erecting buildings of two or more stories in height the European officials extend their buildings over a larger area. This plan affords a much better chance to provide plenty of light and ven-

tilation, both of which are necessary, and which are not sufficiently provided in many of our American establishments.

About one-half of the meat placed upon the public market today in Pennsylvania is inspected. The remainder is slaughtered under varying conditions without inspection and is sold as sound and clean. Last year the ten State Meat Hygiene agents condemned 1,050 whole carcasses, 3,000 organs, such as livers, hearts, etc., and almost 18,000 pounds of meat and meat products. If a small force of men can find in such a short time, in the large and scattered territory they are obliged to cover, such a vast amount of diseased and unwholesome meats, common sense teaches that there are being slaughtered and sold without inspection much more that should be condemned.

Our State constitution gives cities and boroughs specific authority to establish and maintain a system of meat inspection. Many of our own as well as foreign officials have given a great deal of attention trying to work out a form of inspection that would give the most satisfaction with the least expense. In practically every instance they have recommended that each city or borough establish local inspection. After a thorough trial of the various systems of inspection it has been determined that the most practical and economical plan for cities and the larger boroughs to adopt is to provide a public abattoir at which all slaughtering can be done under proper inspection. This would give each municipality absolute control over its own meat supply.

Unfortunately for the consuming public in a number of localities in Pennsylvania, the local municipal officials have adopted ordinances and regulations which forbid the erection and operation of a slaughter house within the borough limits. The only course left open to the butcher is to go outside, away from the town water and sewer connection, both of which are necessary, and build his slaughter house. In such cases he is obliged to select the best site available which is usually in some back woods, perhaps near a spring where he can get enough water to partially wash the carcass, but seldom sufficient to properly cleanse the slaughter room. Furthermore, he must contend with the matter of drainage and disposal of the refuse and offal. Operating under such conditions and without proper supervision there is always a temptation to keep hogs to eat the offal, which is not only unsanitary but is, in many cases, false economy, on account of the hogs developing such diseases as cholera, tuberculosis, etc.

Then, too, the refuse such as the stomach and intestinal contents is very often placed in a pile and permitted to remain close to the slaughter house making an ideal breeding place for flies. A filthy slaughter house and surroundings are usually well supplied with flies and other bacteria carrying insects.

If local Boards of Health do nothing more toward giving the consuming public a clean and wholesome meat supply than to require butchers, especially those who stand on the curb or in public market houses to provide suitable screens so as to prevent the meat from being handled by prospective purchasers and from contamination by flies, they will have rendered a great public service.

If clean, wholesome meat and meat products are to be produced and placed on the market it is absolutely necessary for the slaughtering to be done and the meats prepared, stored and sold under favorable conditions. Instead of driving the private slaughter houses out of the town would it not be better to issue the owners a permit to build and operate within the town, so that they can have proper sewer connection and be within reach of the city water line, both of which are indispensable? Then require the butchers to keep the establishments and surroundings clean. The rural slaughter houses are as a whole more unsanitary than those located in the towns, the reason being as stated above—lack of proper facilities for keeping them clean. We should be consistent with the butcher and not demand a wholesome product when he has been forced to prepare it under unfavorable conditions.

The following recommendations are made:

I. The present system of co-operation between the federal, state and municipal Meat Hygiene Service be continued.

II. It is impossible for the present limited number of the State Meat Hygiene agents to maintain continuous inspection in all parts of the State. The only practical method by which each city and borough can hope to solve the question of continuous inspection is to provide municipal inspection.

III. The proper official of each city and borough within the State should appoint a committee of three, one of whom should be the city or borough engineer to inquire into the economical and practical advantages to be gained by providing a municipally owned and controlled abattoir at which all slaughtering shall be done.

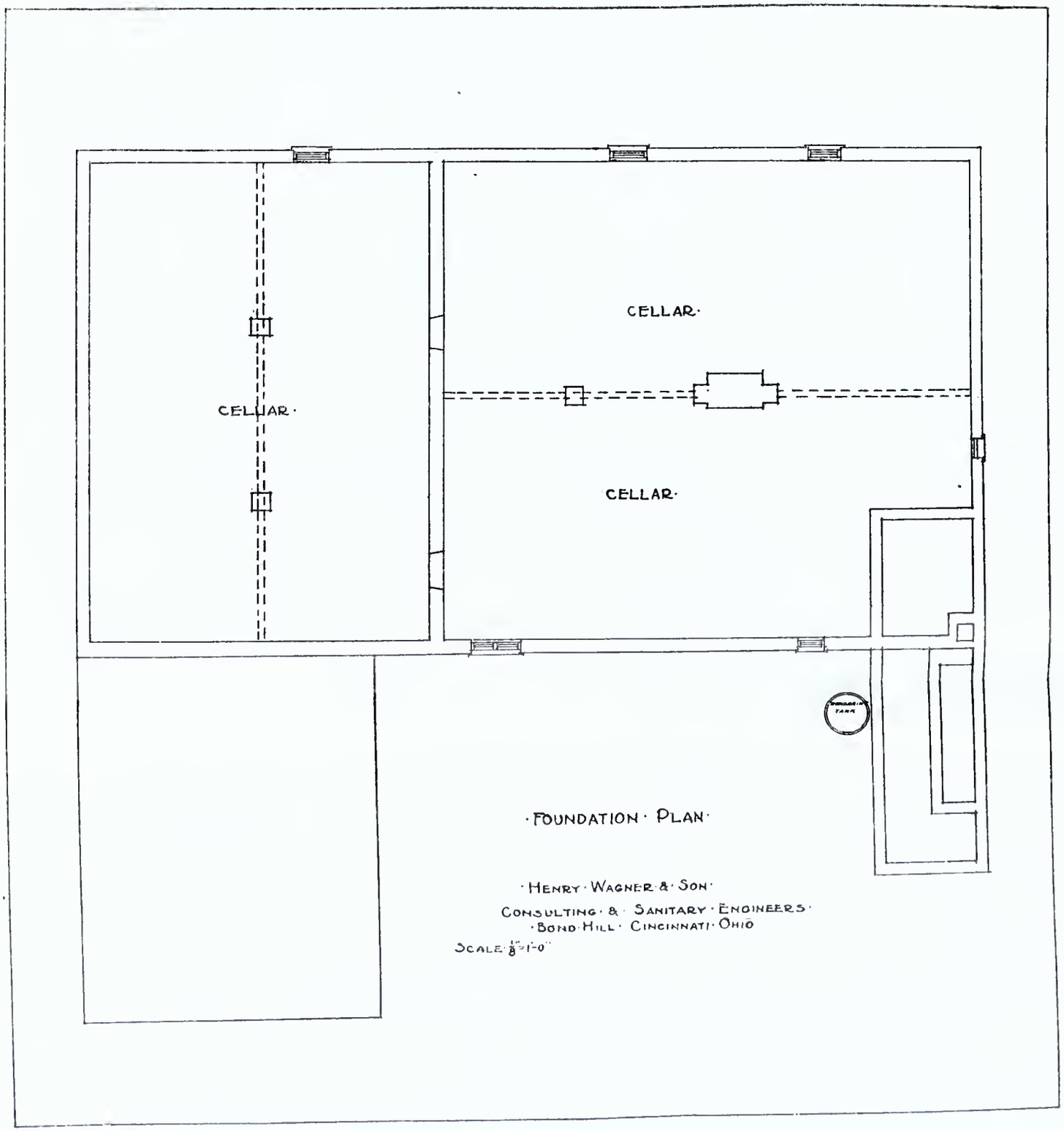
IV. The slaughter house should be accessible to the city water supply and to have an adequate sewer connection.

V. All ordinances or local regulations now in force forbidding the erection or maintenance of slaughter houses within the borough or city limits should be repealed.

VI. Local legislation should be enacted so that private slaughter houses may be erected and operated under reasonable municipal supervision.

VII. Cities and larger boroughs of the State should adopt the German plan (Freibank) of marketing second grade but inspected and wholesome meat. By adopting the German method poor families would be benefited and the plan would be helpful in breaking up the trade now carried on by a few butchers in certain sections who purchase wornout cows and inferior grades of cattle for a paltry sum and sell the meat with no inspection for the same price as first-class beef.

VIII. Local Boards of Health should seek the aid and cooperation of the State Meat Hygiene Service, which is willing to render local officials whatever assistance it can toward bringing about a cleaner and more wholesome meat supply.



PLAN FOR EITHER A PRIVATE OR MUNICIPAL SLAUGHTER HOUSE.

The above is known as an elastic plan, i.e., it can be extended or reduced in size as may be required. While this plan shows a structure 95x100 feet, it can be reduced to 25x25 feet or even smaller so as to handle 3 to 5 or 10 to 25 animals per week, or it can be extended to accommodate all of the slaughtering required for a city of 200,000 population. This plan was supplied by Henry Wagner & Son, Sanitary Engineers, Cincinnati, Ohio.